



Using information and communication technologies in teamwork. A case study of a state university

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ABSTRACT

The purpose of this paper is an analysis of the influence of modern information and communication technologies on teamwork in the university. The research has been conducted in the Department of Management of a Cracow state university in Poland. The authors of this article undertook a field-based questionnaire survey. The sample consisted of 80 participants, including undergraduate and postgraduate students of part-time studies. The underlying paper consists of both theoretical and practical parts. The first one is a literature review and the second one presents the results of the conducted studies. The findings confirm a positive influence of modern information and communication technologies on attractiveness associated with a variety of team members, influence on teamwork promptness and monitoring the progress of work.

Keywords: information technologies, communication technologies, team, teamwork, university, modern means of communication

1. INTRODUCTION

We live in the era of an information society and information is becoming more central today. Taking into account the rapid technological progress it is pivotal to ensure good and effective communication in order to meet current needs of the organizations. Therefore, the organizations started to pay more attention to the technologies that can be used to realize their

key objectives and provide major benefits to the organizations. The uninterrupted flow of information is crucial in managing the organization — it facilitates making decisions, analyzing operations, controlling them and multitasking. Hence, information and communication technologies are one of the most important components of an effective internal communication process. Their dynamic growth has led to multiple changes in the communication processes. It is undeniable that the progress of information and communication technologies has a significant impact on the development of the global information society. New information and communication technologies are used not only by institutions, companies and private individuals but also in education [1]. "Organizations make greater use of information to increase their efficiency, to stimulate innovation and to increase their effectiveness and competitive position, often through improvements in the quality of the goods and services that they produce. There is also a trend towards the development of more information-intensive organizations that add greater amounts of value and thus benefit a country's overall economy" [2]. People, on the other hand, use information on a daily basis as a citizen, a customer and a student. The information society is also characterized by rapid development of technological infrastructure [3].

2. INFORMATION AND COMMUNICATION TECHNOLOGIES IN STATE UNIVERSITIES

Nowadays, an increase in the information resources can be noted. Due to the multiplicity of information that cannot be processed by a man information technology is of great value — it assists in using the information freely. The concept of information and communication technologies can be considered in two dimensions: information (dataset) and communication (flow of information, technology used to transfer information [4]. Information and communication technologies include:

- IT and telecommunications equipment
- IT infrastructure
- computer software
- computer systems and structures
- ways of processing information [5]

Summarizing, information and communication technologies facilitate the communication among people and are means of collecting, storing, processing, transferring, distributing and presenting information. There are diverse forms of information, such as text, sound or image [6]. At this point it is worth noting that information and communication technologies create a great value for such organizations as state universities owing to the fact that they influence the development process of individuals.

A state university is a typical form of an organization due to the facts that it consists of systems and people cooperating together has a set objectives [7]. A state university has specific organizational features, besides those mentioned above, such as formal and hierarchical structure (in form of departments, faculties and sections), owns facilities and resources (labs, libraries, etc.), is autonomous and has its own authority in form of a chancellors, deans [8]. It is a standard practice for universities to use information and

communication technologies — they are used to facilitate the process of education and improve its quality. For the purposes of the underlying paper the authors will study teams at state universities, which are one of the cooperation forms using the information and communication technologies. The primary aim of this paper is hence the analysis of various possibilities of using information and communication technologies in teamwork at state universities.

3. TEAM WORK AT STATE UNIVERSITIES

Nowadays, there is an increased reliance on teamwork in organizations due to the fact that they are their integral part. The process of learning how to work and function in a team starts from a young age. Universities encourage students to work in teams thereby enables them to strengthen their knowledge and gain skills that are highly required by organizations [9]. As a result they will become competitive and marketable in the job market and will create a great value to organizations as it is understood that teamwork boosts performance of individuals and the whole organization [10]. According to Salas et al. [11] there are two or more individuals in a team, whose roles are specified, who perform tasks independently and who strive to accomplish the specific goals for which the team was formed. Teamwork, on the other hand, is defined by [12] as “a cooperative process that allows ordinary people to achieve extraordinary results”. Members of a team share knowledge and skills [13] and the success of the whole team "relies upon synergism existing between all team members creating an environment where they are all willing to contribute and participate in order to promote and nurture a positive, effective team environment" [14].

Table 1. Key features of teamwork.

FEATURES	DESCRIPTION
Commitment to team success and common objectives	<p>Members are fully engaged with the teamwork, strive to realize a common objective, which is clear to them. They are strongly motivated and focused on the goal. They share common beliefs and promote team values. Team members are committed to the group, create a favorable and friendly work atmosphere and form team unity.</p> <p>Benefits: The whole team strive to provide a high quality work and share a common goal. Members are focused on an effective task performance whilst using all available resources.</p> <p>Concerns: Team members may not be equally motivated to achieve a common goal (social loafing effect).</p>
Interdependence	<p>Team members work for a shared success, one cannot succeed without his/her team. Therefore, team members motivate and</p>

	<p>inspire each other, and learn from each other. Each member is a team player and must put aside his personal goals in order to strive for a common goal.</p> <p>Benefits: Each person feels responsible for other members and for successful accomplishment of the task. They are building a team spirit. Members are ready to help and support each other in order to overcome occurring difficulties. Interaction helps team members learn new skills.</p> <p>Concerns: Highly competitive and self-centered members disrupt the team synergetic effect [15] and team cohesion. Some entities are not willing to support other members, who came across a dilemma and have difficulties solving it. The lack of cooperation often causes teams to split.</p>
<p>Interpersonal skills</p>	<p>Despite different personalities the team members care for each other, respect and support each other. They do not hesitate to express their feelings and opinions, and are communicating their expectations towards the group in a clear way.</p> <p>Benefits: Despite the danger of problems occurring at different stages of the project, team members respect, protect and trust each other.</p> <p>Concerns: Members not minding other people's feelings and caring only about themselves. The lack of respect and support leads to misunderstandings and conflicts. Members become closed-minded and selfish.</p>
<p>Open communication and positive feedback</p>	<p>Team should include people with various talents, diverse knowledge and skills. They communicate in a clear and respectful way, give and accept feedback in a tactful manner, and criticize constructively. Team members are open-minded, listen actively and are ready to resolve conflicts.</p> <p>Benefits: Being aware of all the advantages of open communication and feedback allows the team members to discuss matters openly and honestly. Members express their concerns in an open dialog.</p> <p>Concerns: The principles of an open and truthful dialog may cause inconsiderate comments and unjustified criticism. It can</p>

	<p>lead to communication breakdown. Team members may fear to express their doubts and openly discuss the difficulties.</p>
<p>Appropriate team composition</p>	<p>Every team member has a different role, diverse responsibilities and tasks to complete. Each person contributes to the team and has to reconcile the differences.</p> <p>Benefits: A key to success is properly planning the participation of individuals in a team. They have to be diversified in the knowledge, experience and personality. The tasks need to be distributed accordingly.</p> <p>Concerns: Teams formed in an unplanned and aimless manner are doomed to failure since the expectations and skills are not considered thoughtfully.</p>
<p>Leadership, commitment to team processes and being accountable for one's actions</p>	<p>Team members accept both the apparent lack of structure and uncertainty, and make decisions by consensus. The presence of a leader is crucial to each team. Team works in a creative and innovative way. Every member seeks the most effective ways to accomplish the tasks. Each individual is held accountable for the tasks and actions, they cooperate, monitor and analyze the team's progress.</p> <p>Benefits: Each member is aware of his/her role in the team and its importance. Team leader manages the team, is respected by other team members, consults the ideas and makes final decisions. The team has set regulations, rules, procedures, plans and deadlines.</p> <p>Concerns: Issues may arise if a team leader does not have authority over other team members; if team members do not follow procedures, plans, deadlines; or if decision-making process is decentralized.</p>

Source: Authors' own research on the basis of an article "Successful teamwork: A case study" by P. Tarricone and J. Luca [16].

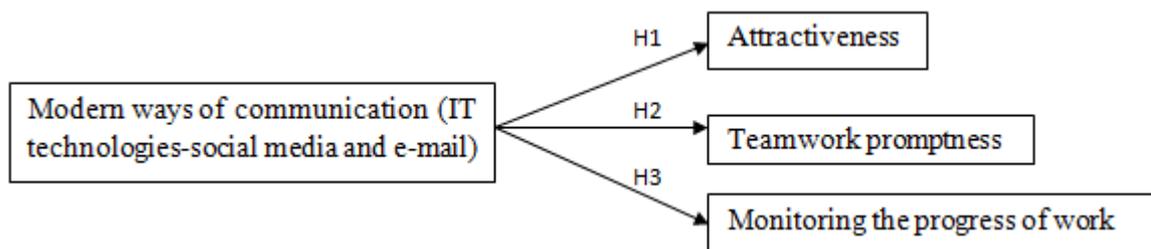
Taking into account the specific nature of teamwork at state universities the authors focused their research on selected methods and tools of information and communication technologies. For the purposes of this paper they pay close attention to modern means of communication, such as social media, Internet and e-mail, video- and teleconferencing applications.

4. RESEARCH FRAMEWORK

4. 1. Aim and hypothesis

The purpose of this paper is to present four ways of communication in teamwork: face-to-face, phone, e-mail and social media. This will allow to answer the question about the degree to which students are using IT technologies in the communication during teamwork. Moreover authors create a theoretical model presenting the influence of using IT technologies in communication on teamwork effectiveness. Effectiveness is measured by three different components connected with teamwork and achieving the objectives: attractiveness associated with a variety of team members, promptness in achieving the objectives, and monitoring the progress of work.

Therefore the conceptual framework is as follows:



Source: Authors' own research

The correlation between the components allowed the authors to formulate the following hypothesis:

H1: *The IT technologies in communication have a positive and indirect influence on attractiveness associated with a variety of team members.*

H2: *The IT technologies in communication have a positive and indirect influence on teamwork promptness.*

H3: *The IT technologies in communication have a positive and indirect influence on monitoring the progress of work.*

4. 2. Research methodology

A quantitative approach was adopted because of the nature of the data. The questionnaire based on a five-point Likert scale ranging from 1 to 5 (1 = strongly disagree, 5 = strongly agree) was used as the data collection instrument. The survey was conducted on a sample of 80 students of the Department of Management of a large state university in Cracow, Poland.

The authors analyzed the collected data and obtained the following demographic variables using descriptive statistics from the questionnaires:

- Gender: woman – 57,5%; man – 42,5%,
- Type of studies: 46,25% – BA; 53,75% – MA,
- Age: 71,25% – under 26 years; 28,75% – over 26 years.

Teamwork communication is verified in the questionnaire by four statements connected with four different ways of communication – two traditional and two modern ones (Table 2). Moreover, attractiveness associated with a variety of team members, promptness in achieving the objectives and monitoring the progress of work as a components of teamwork effectiveness are verified by one statement each (Table 3).

Table 2. Types of modern and traditional communication.

Type of communication		Statement in questionnaire
Traditional ways of communication	face-to-face	While working in a team we meet in person and discuss our project.
	phone	While working in a team we call each other to discuss our project.
Modern ways of communication	e-mail	While working in a team we use e-mail for communication.
	social media	While working in a team we communicate using social media.

Source: Authors' own research.

Table 3. Components of effectiveness in team work.

Teamwork effectiveness	Statement in questionnaire
Attractiveness	I am convinced that modern ways of communication allow to cooperate with different people, which makes the teamwork more attractive
Teamwork promptness	I am convinced that modern ways of communication accelerate the implementation of tasks
Monitoring the progress of work	Because of modern ways of communication project manager has a better control over the progress of work in the team.

Source: Authors' own research.

In order to verify the hypothesis presented in theoretical model and to analyze the collected data authors use the Spearman correlation using Statistica 2012.

5. RESULTS AND DISCUSSION

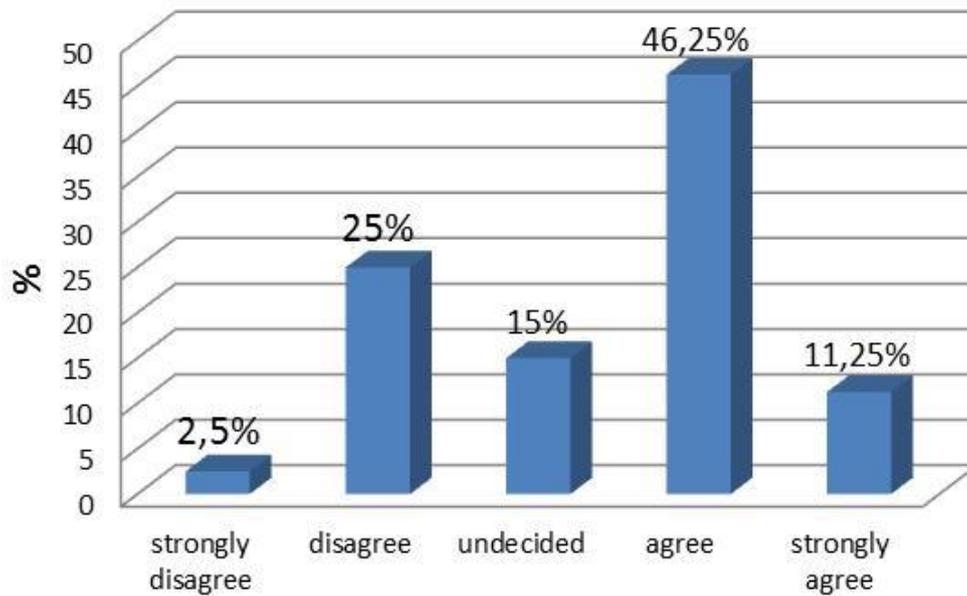


Figure 1. 'While working in a team we meet in person and discuss our project'.

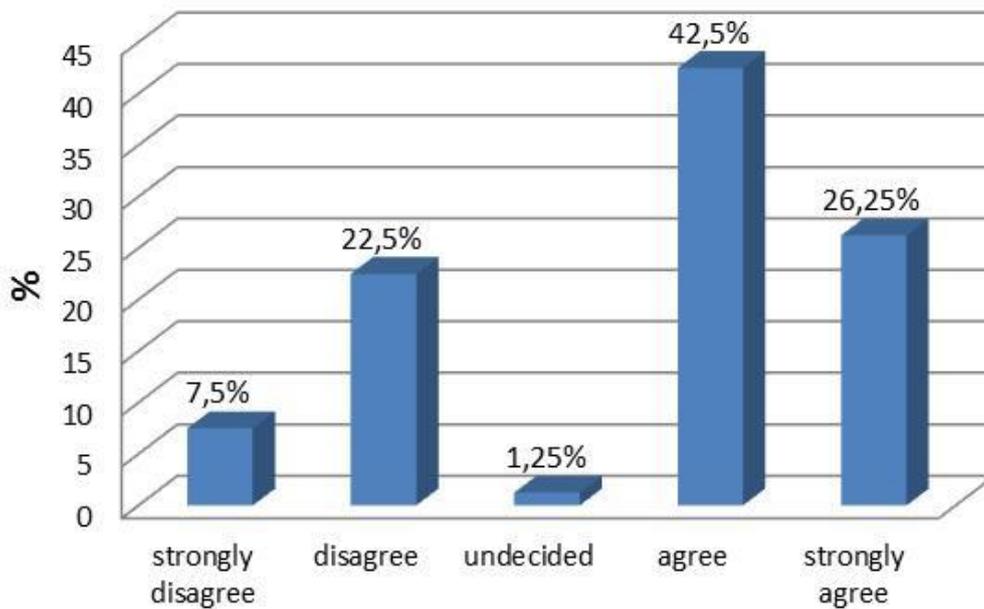


Figure 2. 'While working in a team we call each other to discuss our project'

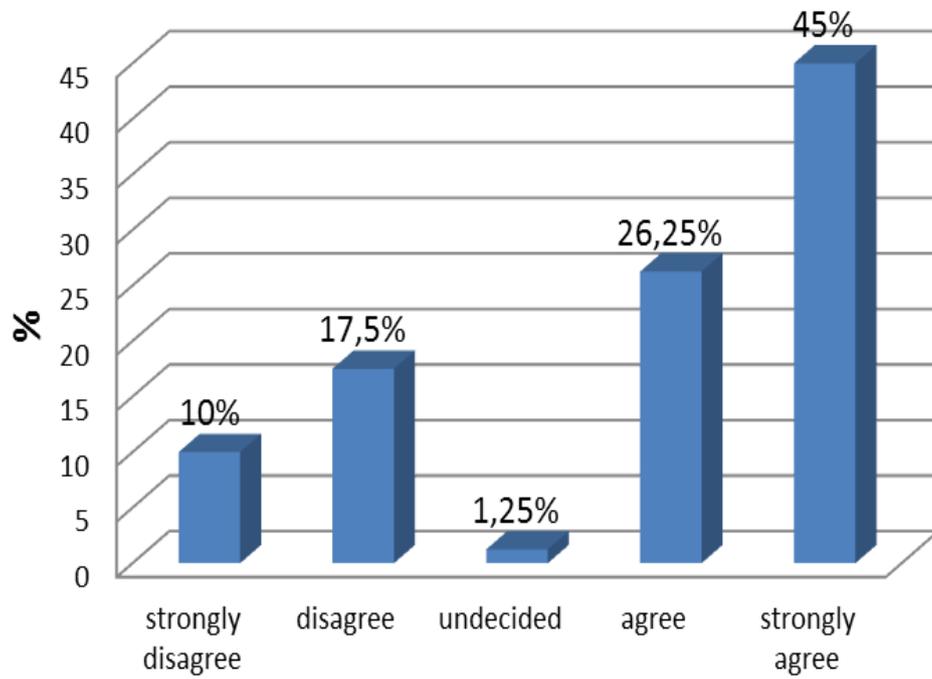


Figure 3. 'While working in a team we use e-mail for communication.'

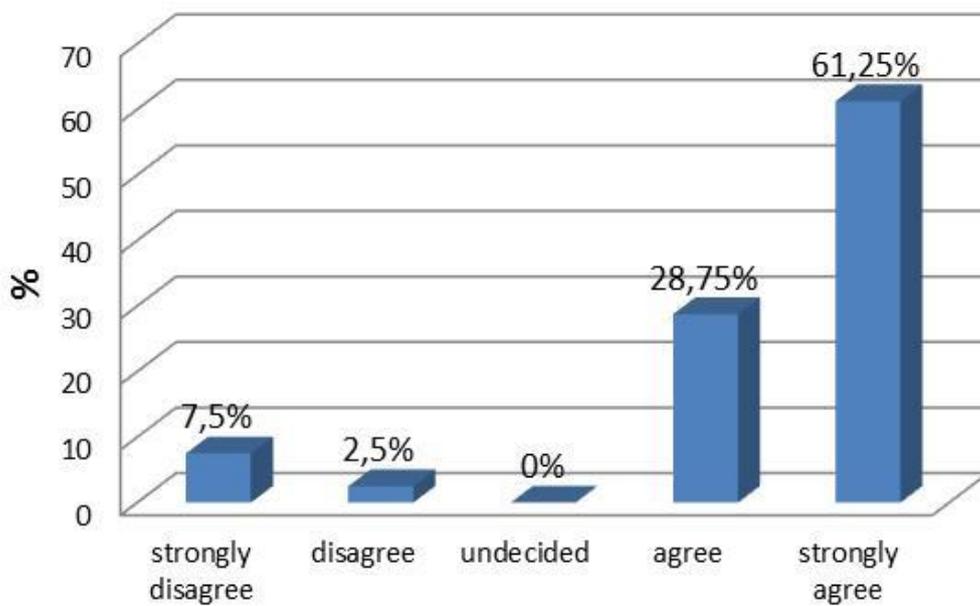


Figure 4. 'While working in a team we communicate using social media'

After statistical analysis it can be stated as follows:

- Hypothesis *H1* regarding low positive influence of modern ways of communication (IT technologies-social media and e-mail) on attractiveness associated with a variety of team members has been confirmed ($r = 0,317$, $p < 0,05$).
- Hypothesis *H2* is statistically positive, which means there is a relationship between modern ways of communication (IT technologies-social media and e-mail) and teamwork promptness ($r = 0,429$, $p < 0,05$).
- Data analysis also confirmed *H3* – a positive relationship (even though low) between the modern ways of communication (IT technologies-social media and e-mail) and monitoring the progress of work ($r = 0,266$, $p < 0,05$).
- All model paths are statistically important.

6. CONCLUSIONS

In today's rapidly changing business environment organizations face a great challenge which is gaining a competitive advantage in the market. The key to survive in this reality is developing an open and honest communication system within the company. Effective communication between people in an organization contributes to a better collaboration. It is widely known that a human capital is one of the most significant assets. In order to fully use this capital an effective communication system proves to be useful. It allows the members of an organization to share their ideas and exchange the knowledge with other colleagues, what results in improved performance. Therefore, teamwork had recently aroused a great interest of companies. Multiple research studies have proven, that teamwork increases performance of individuals and the whole organization. Through teamwork the participants develop new skills, strengthen their knowledge and learn from each other. Modern information and communication technologies facilitate meeting deadlines, motivating other members, reaching set goals, managing and supervising people. Taking into consideration undisputable benefits of teamwork in various conditions, it is essential for such organizations universities to shape, support, promote and encourage teamwork among students. Information and communication technologies are a tool to allow human capital create an added value for a company.

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